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PATENT SPECIFICATION

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Classification 55.7; 54.7.

Drawing Attached.

COMPLETE SPECIFICATION

"Improvements in article vending machines."

We, T. S. SKILLMAN AND COMPANY PTY. LIMITED of 55 Carter Street, Cammeray near Sydney in the State of New South Wales, Manufacturers, hereby declare this invention and the manner in which it is to be performed, to be fully described and ascertained in and by the following statement:—

The invention relates to article vending machines vending a plurality of articles of various character by establishing a credit in the machine and subsequently selecting articles to the total value of the credit.

Article vending machines are known in which a great variety of articles can be dispensed by operation of selector buttons after a credit to the total value of the required articles has been established and indicated by insertion of coins in appropriate slots. The articles are stored, for example, on horizontal belts and at the operation of any of the selector buttons an electrical circuit checks the value of the selected article against the credit available in the machine, and in case the credit is sufficient initiates the release of an article from the corresponding belt

on to conveying means which transport the article to the delivery position. The indicated credit is then reduced accordingly. The electrical circuits for such a machine are, for example, described in detail in Aust. Pat. No. 150,116.

Although such machines operate very satisfactorily and are particularly useful for the dispensing of a number of different articles with only one payment, there is a certain time delay in the operation owing to the time necessary to transport the articles to the customer. This time delay is insignificant, when a plurality of articles are selected, but is noticeable, when only one article is required. Furthermore, some kinds of articles are not very well suited to be stored on storage belts, in particular very flat articles, which take a big space on the belt thus restricting the number of articles which can be loaded on to the belt at one time. This can become very inconvenient for fast selling lines, for example, chocolate blocks, requiring a very frequent re-loading of the storage belt.

The abovementioned disadvantages are

overcome by arranging the articles in known manner in vertical chutes from which they are released one by one at the lower ends of the chutes by the operation of corresponding drawers, which according to the invention are controlled in their operation by electrical circuits of the kind referred to above. Thus the advantages of one payment for a plurality of selected articles, the credit indication and check against the value of each selected article are maintained, and at the same time, the article release is speeded up, and the vertical chutes permit a storage of a great number of flat articles in a rather confined space.

Preferably such an arrangement can be incorporated in a vending machine of the kind described above in which articles are stored on belts, and the credit establishing and indicating means as well as the credit checking circuits can be common to the belt storage device and the chute storage device. In many cases it will be possible to arrange the vertical chutes with the drawers within the same cabinet housing the belt storage machine so that both devices form a single unit.

As the dispensing of each article has to be dependent on the credit available in the machine care has to be taken that no drawer can be operated before a check on the available credit has been made. In the case of the articles stored on belts, the operation of a selector button actuates in known manner an electrical contact which selects the circuits representing the value of the selected articles, compares this value with the available credit and if the credit is sufficient operates a clutch arrangement to release the selected article from the storage belt. The released article then operates temporarily a contact arrangement which initiates the reduction of the available credit by the value of the dispensed article and makes the circuits ready for the next selection. Details of such circuits are, for example, given in Aust. Pat. No. 150,116 referred to above.

According to the invention the same series of functions is carried out by the drawer operated device. As the opera-

tion of a drawer performs two functions, the selection of an article as well as its dispensing from the corresponding vertical chute, care has to be taken that the release of an article by the drawers can only be performed after the credit checking operation has been carried out. Thus, according to the invention the first movement of a drawer performs the selection function by operating suitable contact means, and further operation of this drawer for the dispensing of an article depends on the result of the credit checking over the selection circuits. In a preferred form of the invention the drawers are normally locked, but allow a certain movement for the operation of the selection contacts. If the credit check shows enough credit the drawer is freed so that an article can be dispensed from the chute.

The reduction in the credit after the dispensing of an article can either be performed by contact means operated by the released article or by contacts operable by the drawer in ejecting the article from the chute.

The abovementioned and other features of the invention will be more apparent from the following description in connection with the drawings lodged with the provisional specification in which

Fig. 1 shows an article vending machine according to the invention using different kinds of article storage and release devices with common credit indication and check.

Figs. 2, 3 and 4 show one embodiment of the vertical chute and drawer device according to the invention.

Figs. 5, 6 and 7 show some modifications of the device shown in Figs. 2, 3 and 4.

In Fig. 1 the cabinet 1 houses an article vending machine in which most of the articles are stored on horizontal belts and are selectively released therefrom to a delivery opening 2. The articles for sale are exhibited in a showcase 3, which carries a selector button 4 for each article. Prior to the selection the customer establishes a credit by inserting coins of suitable denominations in the corresponding coin slots 5, and the amount is then

indicated by the indicator lamps 6. Any bad coins are returned to the customer at receptacle 7. According to the invention some of the articles for sale are arranged in vertical chutes 8 of unit 9, and can be released from these chutes by the operation of corresponding drawers 10, to deliver these articles to the delivery position 11. The dispensing of the articles in these vertical chutes is also dependent on the available credit indicated by the lamps 6, so that articles can be selected from the belt unit as well as the chute unit once a credit has been established, as long as this credit exceeds or equals the total value of the articles selected from both units.

Details of the drawer-release device are shown in Figs. 2, 3 and 4. The drawer itself consists of a frame-like structure 12 with a crosspiece 13. Half of the frame is covered by a platform 14. One side of the frame is formed by the drawer handle 15 while the opposite side of the frame carries a stop member 16 which co-operates with a pin 17 movable in vertical direction by a solenoid 18. The drawer is movable in the horizontal plane on fixed supports 19 and guided thereon by the guides 20.

The articles to be dispensed are stacked in vertical chutes 8 so that the lowest article rests on the platform 14. In the normal position the handle 15 rests against the cabinet 9 which has an opening underneath the drawer to accommodate the delivery chute 11. Each vertical chute has a longitudinal slot 21, and a corresponding slot 22 is provided in the cabinet so that an easy check on the available stock can be made.

The lower side of support 19 carries a contact set 23 which is normally held open by a pin 24 fixed to crosspiece 13 of frame 12. A further contact set 25 is mounted on the lower side of the delivery chute 11 for operation by dispensed articles over the contact plate 26.

The operation of the drawer arrangement is as follows:

After the customer has inserted coins to establish a credit in the abovementioned manner, he pulls the handle 15.

As there is a gap between stop member 16 and pin 17 in its normal lowered position, the drawer can make a limited movement before pin 17 engages stop member 16, so that pin 24 leaves the operating spring of contact 23, which closes and thus gives a signal of the selection of a particular article to the electric control gear of the vending machine.

If the available credit is sufficient to cover the value of the selected article solenoid 18 is operated, (in the same manner as the clutch arrangement for belt storage), withdrawing pin 17 from engagement with stop member 16, so that the drawer can be fully extended. In this latter position the lowermost article in chute 8 is not anymore supported by platform 14 but drops into the rear part of frame 12 and is now supported by the two supports 19, which leave a gap 27 between them to allow pin 24 to pass through.

On the return movement of the drawer the article in frame 12 is pushed back by crosspiece 13 off the supports 19 and finally falls into the delivery chute 11. In falling down the chute the article strikes the contact plate 26 thus temporarily opening the contact 25 which in a manner disclosed in detail, for example, in Aust. Pat. No. 150,116 initiates the reduction of the available credit by the value of the dispensed article and restores the circuits for the next selection. At the same time pin 24 has opened again contact 23 to interrupt the selection circuit of this article, and solenoid 18 releases pin 17 to lock the drawer again.

Instead of operating contact set 25 by the falling article this contact set can be operated by the drawer itself as shown in Fig. 5. In this case the contact set 25 is mounted, for example, at the rear of the vertical chute 8 and is operated by the stop member 16 when the drawer is in its fully extended position thus indicating the dispensing of an article.

While with the arrangements shown in Figs. 3 to 5 a certain play has to be provided between stop member 16 and pin 17, the arrangements shown in Figs.

6 and 7 lock the drawer against any movement until the pin 17 is withdrawn by solenoid 18. As the selection contact 23 has to be operated before solenoid 18 is energised this contact is operated by the handle 15 of the drawer which is movable relative to the drawer frame 12.

In Fig. 6 the handle 15 is connected with the frame 12 by means of links 28. The frame carries pins 29 which fit into corresponding slots 30 of the links so that the handle 15 can be pulled out in accordance with the length of the slots before power is exerted on frame 12 of the drawer. The contact set 23 is so arranged that the rear edge of the handle 15 holds the contacts apart in the normal position, in which the handle 15 is held back against the drawer frame 12 by springs 31 fixed to crosspiece 13. When the handle is pulled the contact 23 is released and closes, thus setting the selection and checking circuits in motion. If the check is satisfactory solenoid 18 is operated withdrawing pin 17 and permitting the drawer to be pulled out.

The arrangement of Fig. 7 shows a slightly different structure. In this case the contact set 23 is operated by lifting the drawer handle 15, which is linked with the drawer frame 12 by links 32 pivoted at 35. The drawer handle has a groove 33 which is normally in engagement with a corresponding ledge 34 of the cabinet 9. When the drawer handle is lifted over the ledge the contact 23 closes and at the release of solenoid 18 the drawer can then be pulled out and pushed back again to release the article in the above described manner.

The invention has been described above by way of example and many modifications are possible within the scope of the invention. Any of the shown arrangements can be combined either with an article operated trip contact or with a drawer frame operated contact and this latter contact can be arranged in any suitable manner.

For simplicity reasons no separate "bin empty" indicator has been shown but it is clear that any known mechanically or electrically operated "bin empty" indi-

cator can be combined with the vertical chutes to show the status of the articles in the chute.

Although it is preferable to incorporate the drawer-release unit into the belt vending machine as shown, for example, in Fig. 1, cases may arise where it is advantageous to arrange the drawer unit separately, connecting it by electrical cable to the coin operated credit indicating and checking arrangements of the main vending machine.

Having now fully described and ascertained our said invention and the manner in which it is to be performed, we declare that what we claim is:—

1. An article vending machine dispensing a plurality of articles of various character having electrically operated means to establish and indicate a credit by inserting coins or tokens prior to the dispensing of an article and to check the value of an article against said credit, and in which articles are subsequently selectively dispensed reducing the indicated credit by the value of each dispensed article until the total value of the dispensed articles reaches the established credit, characterised in this that at least some of said articles are stored in vertical chutes and are dispensed one by one from the lower ends thereof by the operation of corresponding drawers which are normally locked by electromagnetic means, each said drawer being freed by said electrically operated means at the selection of said drawer if the credit available in said machine is at least equal to the value of the selected article.

2. An article vending machine as claimed in claim 1 in which articles are stored on horizontal storage belts and in vertical chutes and are selectively dispensed therefrom, and in which the electrically operated means for establishing and indicating a credit and for checking the value of each dispensed article against said credit are common to said horizontal belts and said vertical chutes.

3. An article vending machine as claimed in claim 2 in which the selection of articles is performed by the operation of electrical contacts and in which said

drawers upon actuation operate said contacts.

4. An article vending machine as claimed in claim 3 in which a restricted movement of each drawer in its locked condition operates said electrical contacts.

5. An article vending machine as claimed in claim 3 in which each drawer has a handle movably connected with the body of said drawer and adapted to operate said electrical contacts upon relative movement between said handle and said body.

6. An article vending machine as claimed in claim 5 in which said handle is movable relative to the body of said drawer in the direction of movement of said drawer.

7. An article vending machine as claimed in claim 5 in which said handle is movable relative to the body of said drawer in a direction normal to the direction of movement of said drawer.

8. An article vending machine as claimed in any of the preceding claims in which the drawer carries a stop member which co-operates with a solenoid operated

pin operable by said electrically operated means to lock said drawer in its unoperated position.

9. An article vending machine as claimed in claim 8 in which the dispensing of an article from the lower end of a chute is performed by the return stroke of an actuated drawer whereby the article is released into a delivery chute.

10. An article vending machine as claimed in claim 9 in which a trip contact in the delivery chute is temporarily operated by each released article.

11. An article vending machine as claimed in claim 9 in which an electrical contact is actuated by said drawer in its fully extended position.

12. An article vending machine as described and illustrated in Figs. 1 to 4.

Dated this 11th day of August, A.D. 1954.

T. S. SKILLMAN AND COMPANY
PTY. LIMITED
G. F. CHODZIESNER.

Witness.—A. Morgan.

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161,431

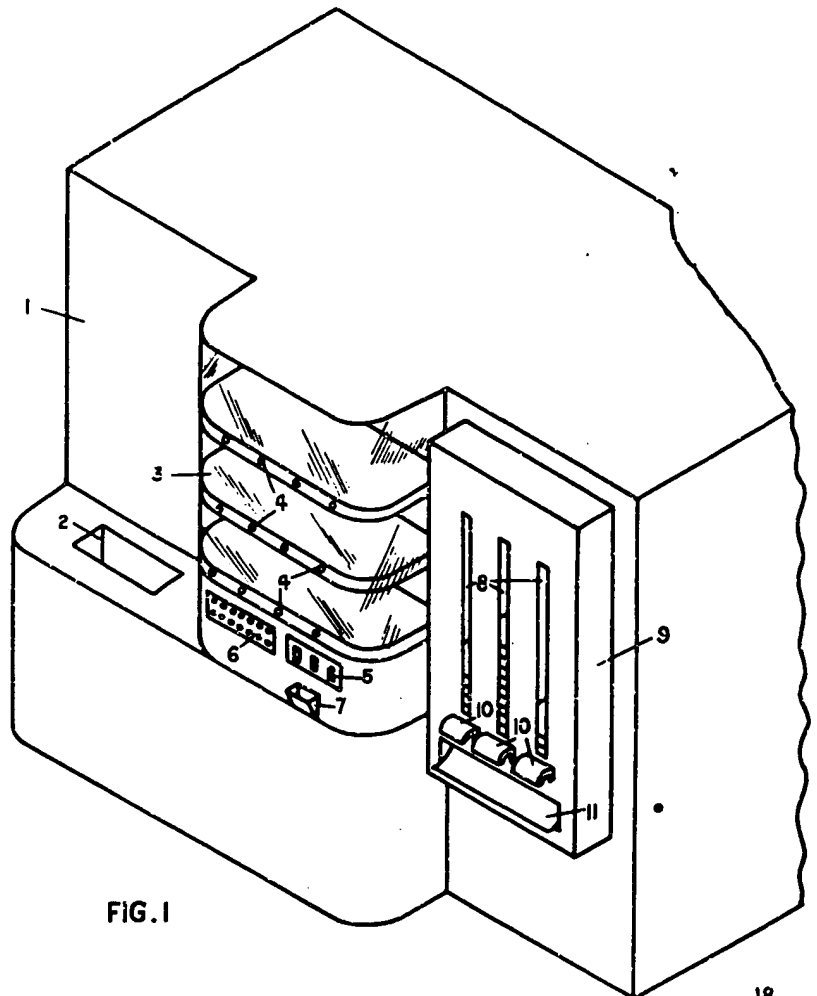


FIG. 1

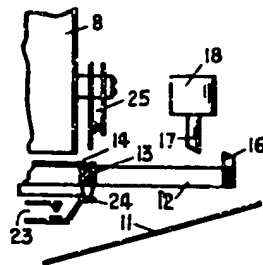


FIG. 5

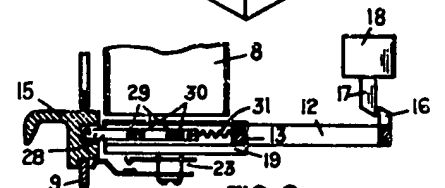


FIG. 6

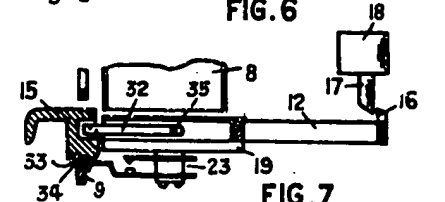


FIG. 7



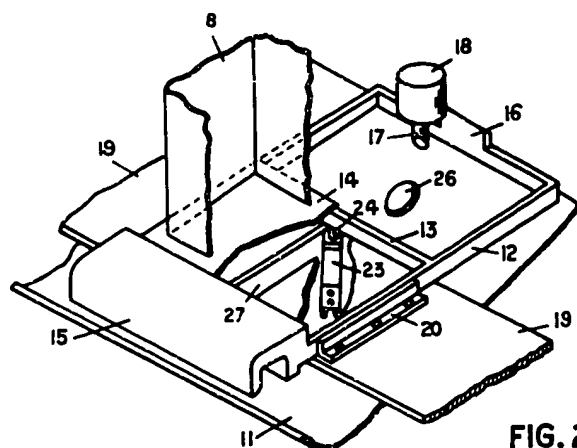


FIG. 2

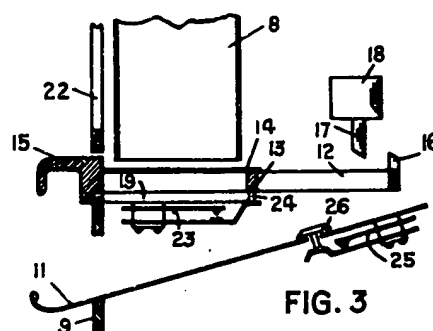


FIG. 3

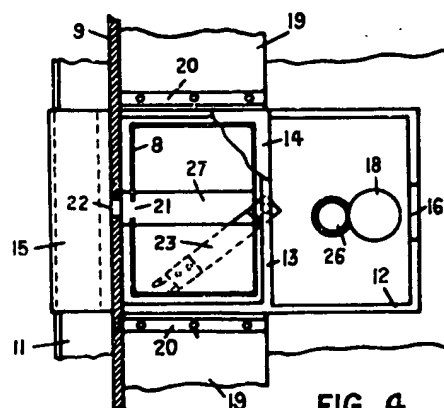


FIG. 4

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